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ACTION OF CHLOROFORM ON THE BLOOD—PROBABLE CAUSES OF ITS FATAL EFFECTS WHEN INHALED AS AN ANÆSTHETIC.

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[Communicated for the Boston Medical and Surgical Journal.]

SIX years ago, I published in this JOURNAL a case in which sudden death was produced in a healthy young woman by inhalation of pure chloroform, given preparatory to extracting a tooth. The case was investigated by a coroner's jury, a *post-mortem* examination being made by Dr. Stedman, Dr. F. S. Ainsworth and myself. The blood taken from the right side of the heart was analyzed, and was found to contain formic acid in considerable quantities, but no chloroform in an undecomposed state. Microscopic examination of the blood, by Dr. J. Bacon, showed that the blood-globules were withered up in a very remarkable manner. Chlorine was also found to be a component of the blood. It was also observed that this blood did not coagulate, nor did the blood-globules subside, but the whole remained a solution, the blood having a cranberry-red color, like red ink.

I have now a phial of this blood before me, it having been kept in my office, exposed to temperatures from the freezing point to above 80° for more than six years, and yet it has not decomposed, nor has a single blood-globule settled to the bottom of the phial, nor has the color changed in the least.

Attention is now called to these remarkable phenomena, which appear to throw some light on the chemical action which chloroform exerts on the blood. As I view the matter, I consider the chemical action on the blood by inhaled chloroform to be this:—Chloroform consists of one equivalent of formyle and three of chlorine. Formic acid consists of one equivalent of formyle and three of oxygen. When chloroform is inhaled into the lungs, the oxygen is abstracted from the blood, and combining with the formyle makes formic acid, while chlorine combines with the blood as a substitute for oxygen. Thus a portion of the blood becomes chemically

changed, disorganized and rendered unfit for its vital functions. Then, if that portion of the blood contained in the heart, and large vessels, which we may style the immediate working blood of those organs, is vitiated, so as no longer to be an appropriate stimulus to the most vital organs, sudden death is most likely to take place through cessation of their action. Our only surprise should be that death does not more frequently follow from inhalation of this dangerous anæsthetic agent, for the decomposition I have described undoubtedly always takes place to a certain extent, and to a sufficient degree to deoxidize a considerable portion of the blood, and to charge it with chlorine and formic acid.

It is well known, that deaths more frequently take place in cases where chloroform is administered in minor surgical operations, or in cases where there is no loss of blood, than in larger and bloody operations.

This I think admits of an explanation in the fact, that where there is large hæmorrhage the vitiated blood, or a portion of it, is removed and is replaced in the vital organs by blood coming from other parts of the body, where it has been but little acted upon by the chlorine—a new working blood being drawn into the large circulating organs, which are thus enabled to continue their proper action, and to supply the brain with its appropriate stimulus. This hypothesis appears to me to cover the cases thus far reported, and I offer it for the consideration of physiologists.

The great disadvantage under which chloroformization labors is the introduction of chlorine, as such, into the composition of the blood. This we know to be destructive of the blood-globules, and an actual poison in the system.

We naturally inquire how this vitiated blood is got rid of, for it evidently never can be re-organized in the circulation. It is undoubtedly thrown off as so much effete matter, by the secernent and excretory organs, and chiefly by the kidneys. Hence, in a large majority of cases, the patients recover with but little damage to their health, though there is always a degree of prostration in most if not all cases of chloroformization.

It is obvious that we may much diminish the danger in employing this agent, by mixing with it a large proportion of pure ether, say at least three fourths of its bulk. By this means we not only dilute the dangerous with a perfectly safe anæsthetic agent, but add the stimulus of ether to overcome the deadly, depressing effects of chloroform. The object in allowing any addition of chloroform to ether, was to obtain a less bulky and more powerful agent than pure ether alone, and to afford greater facility in carrying an anæsthetic agent into the field of battle. It was therefore recommended by me, and was used in the French and Sardinian armies of the Crimea, with great success and safety, while chloroform, which was employed by the English surgeons, produced many fatal accidents. Still, in cities and at home, or in

hospitals, I should always prefer pure washed ether, as it is known to be a safe and sure anæsthetic agent, though it is somewhat bulky. However, from my own experience and observation, I must say I never have known any fatal or even inconvenient effect to result from the employment of the mixture of chloroform and ether in the proportions I have named.

In Austria, by orders of the Government, one ninth of the bulk of chloroform is added to ether, and this is employed in the Austrian hospitals and armies. Its introduction was effected by Dr. Weiger, of Vienna, and it is stated that no fatal accidents have thus far arisen from its use. It is obvious that the dangers from chloroform are diminished in the direct proportion to its dilution with ether. The surgeon is more able to guard his patient from an over-dose, and the comparative lightness of ether, when compared with chloroform, together with the stimulating nature of ether, allows the more ready exhalation of the vapor, and prevents nervous depression from going too far.

As to the impurities of chloroform of commerce, I am aware that it is liable to contain fusel oil and the products arising from decomposition of that poisonous fluid, also free chlorhydric acid, and sometimes sulphurous acid, are present in badly-prepared chloroform. Such chloroform we should at once reject, as being wholly unfit for inhalation, either alone or in any mixture.

Some chloroform, from causes not yet fully known, readily undergoes spontaneous decomposition, with the disengagement of pungent fumes of chlorhydric acid gas. I have two samples now on hand which have thus undergone decomposition. This chloroform was made according to directions contained in the United States Dispensatory, by one of our most skilful pharmaceutists. When freshly prepared, it appeared to be of good quality, but in a few months underwent decomposition, as above stated, and without having been exposed to direct sunlight.

Chloric ether, so called formerly, is nothing but an uncertain mixture of chloroform and alcohol. When administered on a wet sponge, the alcohol is retained by the water, and only the chloroform is inhaled by the patient. The first samples introduced here were merely the unwashed first runnings of the chloroform still. Subsequently, the article was made more uniform in strength, by dissolving one measure of chloroform in three measures of 95 per cent. alcohol. This preparation is now but little used as an anæsthetic, several deaths having resulted from its inhalation—one at Lynn and another at the Chelsea Marine Hospital will be remembered by physicians in this vicinity.

It is well known that there have been a large number of deaths caused by the inhalation of chloroform, while it is believed here that there are no well-ascertained deaths resulting from the use of ether. That deaths occur in grave surgical operations many hours or days after an operation effected under etherization, is no

evidence that the ether caused the death or had anything to do with it, and yet we see such cases tabulated and presented to the public as proofs of death from etherization. Such reports should not be adopted without careful analysis and discrimination of the real facts concerned.

Lest some persons may suppose that the discoverer of etherization is jealous of any substitute for ether, let me say that I was the first person in this country who adopted Waldie and Simpson's substitute for ether, and that I not only made the first pure chloroform, and distributed it gratuitously to physicians, but also induced a manufacturer to procure one of the largest stills, and instructed him in the processes of the manufacture and purification of chloroform. I also made public trials of the effects of this preparation, administered it to our late chief surgeon, Dr. J. C. Warren, and aided in every way the introduction and use of this new agent. Experience has at length satisfactorily proved that chloroform is a dangerous substitute for ether. I feel bound, therefore, to aid in calling upon the medical public to return to their original anæsthetic agent, pure washed ether.

Tests for Chloroform.—The following are the approved tests for chloroform:—

1st. For *Alcohol.*—Take its specific gravity at 60° Fah.; if it is lower than 1·496, alcohol or ether may be present. To test for alcohol, take a graduated glass test-tube, put in a given measure of the chloroform, and add water. Then shake up quickly, stop the tube, and set it in a cold place until the chloroform has entirely subsided; observe how many divisions the chloroform has contracted to, and thus measure the proportion of alcohol that has been dissolved by the water.

2d. For *Aldehyde.*—Hydrated oxide of silver is reduced by it to the metallic state, without heating. A solution of caustic potash turns the aldehydic chloroform brown.

3d. *Formic acid* reduces nitrate of silver to the metallic state, when chloroform containing it is mingled with a solution of the nitrate of silver and is heated.

4th. *Chlorhydric or muriatic acid* is detected, first, by the acrid and pungent fumes of the gas; secondly, by the formation of a dense white cloud, when a feather dipped in aqua ammonia is brought over the impure chloroform; thirdly, by the formation of a white precipitate of chloride of silver, when nitrate of silver solution is added. Litmus paper, wet with pure water, is instantly reddened when held over the mouth of a bottle containing chloroform, giving out chlorohydric acid gas.

5th. *Hypochlorous acid* may be detected by its odor, and by its first reddening litmus paper and then partially bleaching it.

6th. No ready and satisfactory tests for the presence of *methyle* are yet known, but its effects on inhalation are known to be, a peculiar throbbing headache, and rapid prostration of the vital pow-

ers. Dr. Letheby states that these effects may be observed, on merely smelling of a chloroform containing these compounds, the headache coming on in a short time.

7th.—*Sulphurous acid* may be detected by its odor, being the same as that of a burning sulphur match, and by its bleaching litmus paper.

8th. *Hydrochloric ether* may be washed out from chloroform by water, and be obtained by distillation of the aqueous mixture.

Dr. Letheby states that, chloroform should be perfectly colorless and free from opacity; that its specific gravity should be near 1.496. It should neither redden nor bleach litmus paper. It should not become opaque when dropped into water. It should not become cloudy and white when nitrate of silver solution is added to it. It should not coagulate white of egg; and, we may add, it should not turn brown when concentrated sulphuric acid is mingled with it, nor should it be made brown by the action of a strong solution of hydrate of potassa. It should leave no odor in a sheet of blotting-paper from which it is evaporated.

By these tests the physician and surgeon who employ chloroform as an anæsthetic, may know whether he has a pure or an impure article to operate with.

Boston, March, 1861.

TRIAL FOR MURDER BY POISONING.

(Continued from page 136.)

Testimony for the Defence.

Frederick S. Ainsworth.—Reside in Boston. Am a practising physician and surgeon. In practice sixteen years. Have had a good deal of experience in post-mortem examinations—some hundreds of cases. I held the position of teacher and demonstrator of anatomy at Boston. Pursued my studies in foreign countries. Have paid attention to strychnia. It produces death in five to six hours. If given in solution, action much more rapid. In case of several grains of strychnia taken during the night, the person would not be likely to live till ten or eleven o'clock the next day. The spasms are intermittent—come on suddenly; the person is usually conscious that they are coming. They come like lightning; the limbs are drawn up forcibly, back bent, sense of suffocation, difficulty of breathing, fixing of jaws. The patient is usually conscious; he may be unconscious at the very last paroxysms, from exhaustion. Sometimes the spasms are so severe as to throw a person off the bed, but there is no throwing out of the arms. I cannot say it is impossible to throw out the limbs, but it is not done. The patients swallow with exceeding difficulty during the spasms; sometimes call for water or something to drink when the spasms are coming on, and after they are over. I don't know of

any case where they called for stimulants. Strychnia is intensely bitter when dissolved. Should not think whiskey would disguise the taste. Two or three grains in solid form might be swallowed without knowing it; but if in solution, I think it would be impossible without knowing that something wrong had been taken. It is not an irritant poison. I should not expect the redness of the stomach, as testified to, to be produced by strychnia. It would be contrary to reported cases. I do not think that freshness of color is any evidence of death by strychnia. It is not a preservative.

In sudden death, blood often does not coagulate—there is no rule about it; it is occasionally found in a fluid state. It is common to find the lungs more or less filled with blood after death. The brain is also quite often gorged with blood. There is nothing unusual in the discoloration of the neck. It is caused by the blood of the smaller vessels oozing out.

After death by strychnia, the muscles are very much contracted and rigid. It comes on in a few minutes, if not existing at time of death. If death occurs in a spasm, body is rigid, but it is very different from common rigidity—that comes on more slowly. After this is once overcome, the body remains flexible; but in case of strychnia, it flies back after once bent. The fingers are more or less bent; the feet bent in, so that the toes and heels would touch the floor or bed; the spine bent up, and body rests on the head and heels. Such rigidity exists in every case I have seen reported, except one or two. In the case I refer to, no strychnia was found, and it is considered doubtful.

The effect upon animals is to make them become very stiff. I should not consider the result of an experiment upon a frog reliable in a case of life and death. I should not consider that you could rely upon such. There are substances which will kill them, but will not affect man. I should not think the left ventricle could be filled with blood in case of death from strychnia. Have never seen such a case. In death from asphyxia, the right is generally filled with blood.

I heard Drs. Hubbard and Davis's testimony, as to the post-mortem examination. Important organs were not examined—a disease of which might have caused death.

None of the contents of the stomach can pass into the tissues of the stomach without first passing into the circulation. It must first be taken up by the vessels which take up the food, and pass into the blood, through the heart, into the general circulation, and then into the tissues. It can produce no effect till it passes into the blood. If found in the tissues of the stomach, it must exist in all other tissues where the blood goes. It is said, by the best authorities, that it cannot be separated from the blood. The ordinary weight of a stomach is from two to four ounces. In a man of ordinary size, in full health, the weight of blood is from thirty to forty pounds.

Have witnessed symptoms of death from alcoholic drink in post-mortem examinations. The ways of death are almost infinite—delirium, spasms, apoplexy, and convulsions, or rum fits. The patient is conscious out of convulsions, unconscious in them. A case of convulsions requiring two persons to hold the patient, is consistent with convulsions from alcoholic liquor. Flaccidity of the muscles is also consistent. We do not often find smell of rum, even when persons die intoxicated; have not often seen any traces. In a case where a person was in the habit of excessive drinking, was taken sick in night, having spasms, requiring two persons to hold him, and dying the next day, I should say he died from alcoholic poison. Alcohol is a preservative of tissues. It would have no effect to preserve the body, and would have no effect upon the color of surface.

In a case of poisoning by strychnia, I do not think that chemical evidence, unsupported, would be sufficient to rely upon.

Cross Examined.—I think the rigidity of the body may be considered a necessary characteristic of poison by strychnia, it exists in so many cases. None is absolutely necessary; congestion of the brain is common; fluidity of blood is found.

I am not able to say what would be the effect of a great deal of spirit upon poison by strychnia. The effect of alcoholic liquor is to relax the muscles. It might have the effect of removing rigidity. I should not think it would modify it, but I am not prepared to say it might not.

If two to three grains of strychnia were given in small doses, death would not occur so soon. If mixed with spirit and sugar, the taste might be modified. There would be none of the napping between the spasms. One of the characteristics is a desire to be rubbed and to be held. Death may take place in spasms or in the interval between them. The appearance of the heart I have stated is not expected where the person dies in the interval.

Frogs may be killed by saltpetre. I don't think I should be willing to call anything tetanic spasms in these. A quarter of a grain of oxalic acid might produce death in a frog in time, but probably not within an hour. Think the oxalate of ammonia will kill them. I should want to extend the substances to more than two before I would give an opinion upon their identity. I don't think you could reason from the similarity of results that the substances were the same. Frogs are used in connection with the tests for strychnia for physiological purposes.

Taylor and Frondan are both eminent chemists—both published books. There is no such thing as digestion going on during convulsions. After the amount required to produce death had gone into the blood, no more would be taken up after death.

Re-examined.—Digestion depends upon the kind of food; ordinarily digests in three to four hours. I think the taste of strych-

nia would not be disguised by being dissolved. Offering the patient drink is said to usually result in bringing on a spasm.

The bath, or introducing poison under the skin, is the most approved way of experimenting upon frogs. No doubt it could be done by introducing it into the stomach. It would take longer to get into the circulation in that way.

If I were satisfied that there was a sufficient quantity of poison in the stomach to produce death, it would be evidence, but not conclusive, that death was caused by the poison. Strychnia can be detected when in the contents of the stomach. It is very doubtful if it can be found in the tissues. I mean, by tissues, the substance of the stomach. Nothing which comes in contact would remain in the substance, except violent caustics. I don't profess to be a chemist, and have no practical knowledge of these matters. My opinion is that strychnia cannot be found after it goes into the circulation.

Dr. George W. Kittredge.—Reside in Newmarket. Practising physician and surgeon twenty-five years. Have made a number of post-mortem examinations. Where the spine, spleen, pancreas, rectum, &c., were not examined, should not consider it satisfactory. Have seen effects of alcoholic liquors. In a case where the patient was in the habit of excessive use of liquor, ate a hearty supper at night, went to bed soon after, was taken sick during the night, with convulsions, requiring two persons to hold him, and died the next forenoon, I can see nothing inconsistent with death from alcoholic liquor.

But in that case, if even one grain of strychnia were found in the stomach, I should have no doubt death was to be attributed to the poison.

[To be continued.]

AN AFFECTION OF THE THROAT RESEMBLING DIPHTHERIA, FOLLOWING VARICELLA.

By William Read, M.D., Boston.

[Communicated for the Boston Medical and Surgical Journal.]

The patient, a girl ten months old, was taken with chickenpox on Friday, January 4th. The disease went on in its regular course, the eruption coming out very freely, and the scabs forming in the usual manner, and at the usual interval. Except considerable fretfulness and slight febrile symptoms, there was nothing remarkable in the case, and professional advice was not sought after the real nature of the attack was known.

Jan. 15th.—I was called in the early part of the day, and found the child evidently ill. Expression of the face bad. The mother reported that on the previous evening it acted as if the throat were sore. It could not nurse long without stopping to breathe, nor

could it lie down without dyspnœa. Was very restless through the night, being frequently waked by choking. Now, respiration indicates a quantity of loose substance in the throat. Lips rather dry. Tongue somewhat coated. There is a great abundance of thick, tenacious, whitish secretion in the throat that seems to fill it as far as can be examined by depressing the tongue with the handle of a spoon. Palatal arch and the roof of the mouth, together with the region about the tonsils, and in fact all of the interior of the mouth as far as can be seen, injected, but not of a bright red. The color was more yellowish, resembling somewhat that of the conjunctiva in jaundice. Submaxillary glands swollen and tender. Within a few days, has had a discharge from the right ear. Neck seems to be moved with difficulty. Dejections natural in character and frequency. Urine high-colored and very pungent. Voice modified by the condition of the throat. Heat of skin but little above normal standard. Pulse not counted, owing to resistance made by patient. ℞. Ammon. carb., gr. vi.; syrup. simpl., ʒ i.; tr. cinchon., ʒ ss. M. A teaspoonful every two hours. ℞. Acid. muriat., ʒ ss.; mel., q. s.; aquæ, ʒ ij. M. Ft. gargar.

5, P.M.—No change. Continue treatment.

16th, 9½, A.M.—Expression of face better. Had a restless night. Throat, and all of the mucous membrane that could be seen, covered with a dirty-white pultaceous coating. Respiration improved. Heat of skin same as yesterday. Has had one dejection. Urine less pungent and more abundant. Has nursed some (did not nurse at all yesterday). Continue treatment.

6, P.M.—Soon after last visit, patient had an attack of dyspnœa, very severe and long continued, from which she rallied after vomiting up a quantity of tenacious mucus. Since then has continued in about the same condition. Skin cool. Mouth and throat in same condition. Had no nausea previous to this morning. Has coughed some, with a hoarse sound. Mother reports that she has experienced no soreness of the nipples, nor do they seem to be affected at all by the condition of the patient's mouth. To have an emetic of pulv. ipecac. p. r. n. ℞. Potass. chlor., gr. x.; tr. ferri mur., f ʒ i.; syrup. simpl., f ʒ ij. M. A teaspoonful every two hours. ℞. Argent. nit., gr. xxx.; aquæ, ʒ i. M. Ft. sol. Apply with a camel's-hair pencil freely over affected surface.

9½, P.M.—Has had no sleep without dyspnœa since last visit; pulse 124 (under the knee), soft and rather feeble. Is vomiting freely a thick creamy mucus. Mucous membrane of mouth still covered with the coating. Dr. C. E. Buckingham, who was present at this visit, suggested that the case was one of aphthous sore mouth, caused by debility brought on by the attack of varicella. To continue treatment, and add wine p. r. n.

17th.—Mother reports that there has been less suffering from the dyspnœa though the night than during yesterday. Patient is sitting up. Expression of countenance better. Condition of

mouth but little changed from last report. Can nurse and swallow with much greater ease. Skin cool. Pulse 144.

At 11, A.M., Dr. D. H. Storer saw the case, and at 3½, P.M., Dr. Stearns. Appearances the same generally, but the exudation is fast disappearing. A quantity of the secretion was examined microscopically by Dr. Ellis, who reports nothing peculiar.

18th.—Throat almost entirely free from exudation. Expression of countenance natural. Passed a very comfortable night, requiring but little attention. Is very hungry and nurses easily. Omit washing the throat with the sol. argent. for the present, but continue other treatment.

19th.—Doing well. Throat well, except two patches on left arch of the palate near the tonsil, which look like canker. Has occasional attacks of dyspnœa when asleep. To have pulv. ipecac. p. r. n. Continue other treatment.

20th.—But one patch of the exudation left. The throat is full of flaky, white substance. Could not nurse yesterday, and had a good deal of trouble in breathing. To renew sol. argent. nit. Continue other treatment.

21st.—Has had no trouble since application of solution to throat. Looks well, nurses well, and has no trouble in respiration. Throat, so far as can be seen, free from exudation and natural in color. Discontinued visits, with directions to use the wash as occasion might require, and continue the other treatment for three or four days.

Bibliographical Notices.

A Treatise on Human Physiology; designed for the use of Students and Practitioners of Medicine. By John C. Dalton, Jr., M.D., Professor of Physiology and Microscopic Anatomy in the College of Physicians and Surgeons, New York, &c. &c. Second Edition, revised and enlarged. With two hundred and seventy-one Illustrations. 8vo. Philadelphia: Blanchard & Lea.

Dr. Dalton needs no word of praise from us. He is universally recognized as among the first, if not the very first, of American physiologists now living. The first edition of his admirable work appeared but two years since, and the advance of science, his own original views and experiments, together with a desire to supply what he considered some deficiencies in the first edition, have already made the present one a necessity, and it will no doubt be even more eagerly sought for than the first. That it is not merely a reprint, will be seen from the author's statement of the following principal additions and alterations which he has made:—

"First, the introduction of an entire chapter devoted to the consideration of the *Special Senses*, which were only incidentally treated of in the former edition.

"Second, the re-arrangement of the chapter on the *Cranial Nerves*,

and the introduction of some new views and facts in regard to their physiology.

"Third, an account of some new experiments, original with the author, relating to the function of the *Cerebellum*, and the conclusions to which they lead.

"Fourth, certain considerations respecting the general properties of *Sensation* and *Motion*, as resident in the nervous system, which are important as an introduction to the more detailed study of these functions.

"Fifth, the introduction of a chapter on *Imbibition* and *Exhalation*, and the functions of the *Lymphatic System*; including the study of endosmosis and exosmosis, and their mode of action in the animal frame, the experiments of Dutrochet, Chevreuil, Gosselin, Matteucci, and others on this subject, the constitution and circulation of the lymph and chyle, and, finally, a quantitative estimate of the entire processes of exudation and re-absorption, as taking place in the living body.

"Additions have also been made in various parts, to the chapters on Secretion, Excretion, the Circulation, and the Functions of the Digestive Apparatus. In every instance these alterations have been incorporated with the text in such a manner as to avoid, so far as possible, unnecessarily increasing the size of the book.

"Twenty-two new and original illustrations have been introduced, of which five replace others in the former edition, which were regarded as imperfect, either in design or execution. The remaining seventeen are additional."

The present, like the first edition, is printed in the highest style of the printer's art, and the illustrations are truly admirable for their clearness in expressing exactly what their author intended. It is for sale by Ticknor & Fields.

Theory and Practice of the Movement Cure; or the Treatment of Lateral Curvature of the Spine; Paralysis, Indigestion, Constipation, Consumption; Angular Curvatures, and other Deformities; Diseases incident to Women, Derangements of the Nervous System, and other Chronic Affections, by the Swedish System of Localized Movements. By Charles Fayette Taylor, M.D. With 71 Illustrations. 12mo. Philadelphia: Lindsay & Blakiston. 1861.

This little book is the precursor of a larger one which the author hopes hereafter to lay before the public. We have taken it up, we admit, with some degree of prejudice against it, as advocating one of the systems of special practice which experience has shown so generally disappear after a short run, without giving any permanent benefit to mankind. The work, however, is modestly written, and by an educated man, apparently capable of appreciating the class of cases to which this system of passive motion is properly applicable. As one of the means which may stimulate nervous and muscular energies which are dormant from feebleness of will or the debility consequent to protracted illness, we can conceive of its answering an excellent purpose, in the hands of *an educated physician*. No doubt many *bed cases* would be greatly helped if not cured by it. In the hands of an ignorant, self-conceited pretender it would be likely to do quite as much harm as good. We sincerely hope that it may be kept out of the hands of this last class, who have done so much heretofore to dis-

gust reasonable people with the very name of anything which claims to be a special curative agent. It is quite impossible for physicians in general practice to apply such treatment with anything like a satisfactory thoroughness; and it is seldom that they can turn to any one whom they can trust to do it for them. From the general tone and character of this book, we should think any case, specially suitable for the treatment, might be safely placed in the hands of the author. The book is neatly printed, and the illustrations are all that the subject requires.

Infant Feeding and its Influence on Life; or, the Causes and Prevention of Infant Mortality. By C. H. F. Routh, M.D., &c. &c., Physician to the Samaritan Free Hospital for Women and Children, &c. &c. Pp. 379, 16mo. London: John Churchill. 1860.

One of those compact, practical, *nutritious* English books that a physician is glad to get hold of. It is full of valuable information, and abounds with statistics which the author understands the fair and proper use of. Although a small book, it is evidently the condensed result of a vast amount of faithful labor. The subject of which it treats can hardly be overestimated in its importance, and we look upon this contribution to its elucidation as one of the very best which has issued from the press. We hope soon to see it in American dress; and we will add, we should be glad to see such and all English medical books worth re-publishing, re-printed with the same regard to the pecuniary advantage of the author which has been shown by some of our American publishers of more exclusively literary works. We never open an American re-print of an English medical work without a feeling that the publishers are guilty of little short of absolute piracy in thus coining money from the unrequited labors of our brethren on the other side of the water. The practice is entirely unworthy of the encouragement of a noble and liberal profession, such as ours ought to be. The publisher who initiates in medical literature the practice which Messrs. Ticknor & Fields, of this city, have so honorably pursued in other departments, would deserve and receive the lasting honor of the whole profession.

Seventh Report to the General Assembly of Rhode Island, relating to the Registry and Returns of Births, Marriages and Deaths in the State, for the year ending December 31, 1859. Prepared, under the direction of John R. Bartlett, Secretary of State, by Edward A. Crane, M.D. Providence: 1860. Pp. 96.

The population of Rhode Island, as presented approximatively in 1860, is 174,624, the census having given, in 1850, 147,545, making the increase in the State, for the past ten years, 27,079.

The number of births recorded for the year 1859, including still-born, was 4,554, being an excess over those of the preceding year of 237. Of the whole number, not quite one half were of foreign parentage. Only 73 were of colored parents.

As has been invariably the case, says the reporter, there were more births in the *last* than in the *first* six months of the year. This, it will be remembered, was noticed in the Registrar's Report for South Carolina, the greatest fecundity there being in September and December, while the fewest births took place in January and February. It is a

singular circumstance that in England the excess is in the first half of the year. This difference might be partly attributable to a difference in the customs of the two countries, as to the time when marriages are more likely to be consummated, were it not that such does not exist; for it appears that the largest number of marriages are solemnized in England, as in all parts of this country having a registration system, in the last quarter of the year.

The excess of male births falls slightly below that of other States, a fact, as stated in the Report, difficult to be accounted for. The greatest excess was in February, conception having taken place in April: and the least in May. The result of years of observation may possibly throw some light upon a question which has much puzzled physiologists, and that is, the causes which influence the predominance of one over the other sex. If season have such influence, careful and extended observation cannot fail to detect it. We are inclined, however, to attribute it to widely different causes, not denying the possibility that any external influence may exert an effect. So long as this question belongs to the domain of the purest speculation, we may be permitted to express an opinion to which we have been inclined—a result of long observation—and that is, that the sex of the offspring depends upon the predominance of procreative power in one or the other of the parents; in other words, *the parent possessing the greatest procreative power will show it pretty certainly in the opposite sex of the offspring.* If we take, for example, a family in which girls predominate largely, it will generally be noticed that the father is more vigorous, so far as one can judge from external signs, than the mother, and *vice versa.* This superior vital power may be dependent upon the relative youth or health of one or the other, upon season, temperament, and other causes. Instead, then, of the seniority of one or the other parent acting directly in the production of a child of the corresponding sex, it may be said that the sex in such a case is due to the greater vital or procreative power of the younger or more vigorous. Of course, as we have before said, every hypothesis, thus far, is based upon speculation, or we should not have ventured to express an opinion on a subject which is probably destined to remain involved in obscurity.

The number of twin births was 59, or 1 in 85. This is a higher rate than was reported in England in 1846, that being 1 in 91. In France the proportion is 1 in 110. Plurality cases seem to have been most frequent among the Irish portion of the population. Two cases of triplets are recorded.

The number of marriages for 1859, was 1,672, being an increase of 234 over the number recorded in the preceding year. This result the Registrar attributes partly to the more complete returns, due to the greater efficiency of the registration system, and also to the increased general prosperity over that of the two preceding years. The largest number of marriages took place during the last quarter of the year, as we have already had occasion to remark. With regard to the ages at which marriages were consummated, if it be true, and we are not inclined to doubt it, that this condition is entered the earliest in places where the necessities of life are most readily obtained, and the individual is soonest able to become self-supporting, Rhode Island must be peculiarly favored, as more persons are married under 20, and fewer between 20 and 30, than in England or Massachusetts.

Only twenty marriages are recorded between persons of color. Marriage between whites and negroes is contrary to law, and as the penalty is high to all parties concerned, it rarely takes place.

The whole number of deaths was 2,270, this being a smaller number than has been reported since 1856, a result attributable partly at least to the non-prevalence of diseases of the zymotic class. In Bristol County, however, the zymoses were uncommonly prevalent, rendering the rate of mortality considerably higher in this than in other parts of the State. The least mortality was in the months of June and October, and the greatest in August; in the latter month, diseases of the bowels prevailing, as in other parts of the country. The mortality seems to have been comparatively large among the aged, and small among children—twenty-five per cent only of deaths in Newport County being of persons under 5 years of age, while in the previous year it was no less than forty per cent.

We have only space to add that the classification of the causes of death is, we are convinced, the best, on the whole, that can be adopted; it being similar to that recommended by the American Medical Association, which is a modification of that of Dr. Farr. This divides the causes generally into the *zymotic* and *sporadic*, these being again subdivided.

The report is most complete, showing the evidence of much care and labor, and affords additional evidence of the advance that has recently been made in this country in this department of statistics.

Diphtheria; its Nature and Treatment, with an account of the History of its prevalence in various Countries. By Daniel Denison Slade, M.D. Being the Dissertation to which the Fiske Fund Prize was awarded June 11, 1860. 8vo., pp. 85. Philadelphia: Blanchard & Lea. 1861.

This is a re-print of Dr. Slade's admirable Essay, as it appeared in the *American Journal of the Medical Sciences*. It is published at the express request of the Trustees of the Fiske Fund, "believing that it contained a full and accurate résumé of what is known concerning a disease which is now attracting universal attention," and it will be found to come fully up to the estimate of the Committee.

Medical Reports from the Mass. General Hospital.

Prepared by Robert Ware, M.D.

Fibrous Tumor of the Uterus, with Ante-version. (Under the care of Dr. Minot.)—Anne Q., 30 years, married, entered Sept. 26th, 1860. Confined, with a stillborn child, in January, 1859. General health good till since a miscarriage, two months since. Began to suffer with severe pain in back and limbs, preventing her from standing upright; these came on in paroxysms, would cease for a time, and then come on again suddenly, and confine her to her bed. Was free for some time till 22d inst., since which time has suffered much; has also attacks of palpitation and dyspnœa; costive, poor appetite, and pain across lower abdomen. Catamenia regular, and now present. Above and

behind pubes, a little to the right of the median line, is a hard, rather irregular, roundish tumor, extending downwards to the right side, not tender; micturition free. Patient states that this was noticed during her first pregnancy, and has not altered in size since then. On examination, per vaginam, the cervix uteri was felt directly behind the pubes, extending completely across the vagina, the os being directed backward; motion of the cervix moved the external tumor. On drawing the cervix forward, by hooking the finger behind, thus remedying the anteversion of the uterus, the tumor disappeared. She was ordered rest, with a pill of nux vomica and colocynth, occasional opiates, and rapidly improved in general health.

Oct. 3d.—She sat up all day. Examination showed the uterus to be in the same position as before, and through the rectum a smooth projection, about the size of a chestnut, was felt, extending from the fundus of the uterus. She was much benefited by wearing an abdominal supporter, and was discharged, Oct. 17th, "much relieved."

Bright's Disease; Death; Autopsy. (Dr. Minot.)—Gustav. O., 50 years, a chemist, married, a native of Saxony, and resident at Manchester, N. H., entered August 3d, 1860. Patient states that his health has always been good till within two years; he never had rheumatism, and there is no hereditary tendency to cardiac disease. Two years since, he found that any unusual exertion brought on a palpitation of the heart, and this gradually increased till even mental excitement would cause it; there was no dyspnœa and no œdema. About two months ago he began to notice that he was unable to walk up stairs without increasing the palpitation and causing some dyspnœa; and, after an attack of "dysentery" four weeks since, œdema of the feet and ankles appeared, and has continued till now.

On entrance, is still able to walk out of doors, but has considerable œdema of legs at night; appetite good; bowels regular; urine, on examination, found natural in quantity, high colored, specific gravity 1.016, acid, and containing no albumen; sleeps poorly because of dyspnœa when lying down; dulness on percussion at base of right back, and absence of respiratory murmur below the angle of the right scapula; murmur feeble between the angle and spine of the scapula and normal above the spine, but feeble at the base of the right chest in front; the action of the heart is feeble, rapid and irregular; pulse 120; tongue clean. R. Pulv. digitalis, gr. ss.; colchici semin., gr. i.; sodæ bicarb., gr. i. M. In pill three times a day. Apply tincture of iodine to the right back.

He had more comfortable nights after entrance, with the exception of copious sweating; some œdema of the eyelids was noticed on the 10th, when the pupils were slightly dilated, and the pill was omitted. He was ordered, on the 11th, three grains of the iodide of potassium with two drachms of the sweet spirits of nitre, three times in the day, and six grains of the oxide of zinc were given at night.

13th.—Very comfortable; sweats less; quantity of urine increased; œdema diminished; has had, for some years, a defect in the vision of the right eye, caused, as he supposes, by the use of the microscope, and since entrance has been troubled by muscæ volitantes in the day time, and flashes of light at night. His symptoms improved very rapidly, and he left the Hospital, August 20th, "much relieved."

Soon after leaving the Hospital, his dyspnœa returned; he grew

rapidly worse, and re-entered Sept. 6th. The dyspnœa and general prostration were very marked; skin cool and damp; mind clear; pulse could not be counted; abdomen much enlarged, and generally resonant; the outline of the liver could be traced nearly to the umbilicus; urine scanty. He drank a bottle of Hock wine in the night, and got some sleep after an opiate.

Sept. 7th.—His condition is about the same; substitute brandy for the wine, give him an enema, and let him have beef-tea for diet.

8th.—Chest extremely resonant, especially at both backs; respiratory murmur everywhere strong; somewhat delirious during visit; dejection from enema. R. Pil. assafœtidæ, gr. iij., every three hours. R. Spt. ether. nitros., ℥ij., every two hours.

9th.—Has been delirious most of the time, but was quiet and drowsy during a part of the night; no dejection; urine rather more free; pulse very rapid, irregular and feeble; great palpitation of the heart—no souffle has been or can be detected; has taken but little food; skin hot; abdomen tympanitic. R. Hydrarg. submur. et pulv. jalap., aa gr. x. In two hours, R. Ol. ricini, ℥ij. After the operation of the medicine, R. Tinct. verat. virid., gtt. vi.

10th.—He slept for an hour and a half this morning, but with that exception was very delirious and restless; had one free dejection this morning; pulse as yesterday; skin cool; no cough; has taken about half a pint of beef-tea and the same quantity of brandy. Continue the pill of assafœtida, and apply a blister four inches square to the left breast.

11th.—He has been more quiet, and has had several hours sleep; pulse as before; tongue has a thin, brown, moist coat; respiration 28, and the breath has a peculiar offensive, spirituous odor.

12th.—General condition about the same; urine very abundant; tongue dry and brown; pulse cannot be counted. He died within twenty-four hours of the visit.

Autopsy, by Dr. Ellis. Half a pint of serum was found in the right pleural cavity, and the lower lobes of both lungs were very œdematous; the heart was somewhat hypertrophied; no valvular disease, except some yellow opacity of the mitral valve; the liver was fatty, and its external surface was finely granular; the kidneys were congested, but smooth externally; their appearance on section, though not perfectly healthy, could hardly be said to indicate any particular disease, but, under the microscope, the tubuli were found to contain much opaque material and fat globules; there was a small fibroid growth beneath the mucous membrane of the stomach; other organs not remarkable. Examination of the urine showed the presence of bile and a little albumen, but no casts of the tubuli were found.

Sciatica—Subcutaneous Injections. (Dr. Minot.)—John H., 49 years, married, a farmer, a native and resident of Ipswich, entered August 29th, 1860. Patient states that he has no hereditary tendency to rheumatism, and has never had rheumatic fever, but has suffered from supposed rheumatic pain. In April he was attacked, without known cause, with violent pain in the lumbar region, which soon extended into the hips and thence down the thighs to the knees. This is at times very severe, and is not regularly intermittent. He is in the habit of taking opiates. The bowels are costive, but with the exception of this pain his health is very good; there is some tenderness on

pressure behind the trochanters. He was ordered "house diet," three grains of sulphate of quinine were given every three hours, and a small blister was applied behind each trochanter.

This treatment gave very little relief, and the iodide of potassium, in the dose of five grains three times a day, was substituted for the quinine on the 5th.

Sept. 7th.—Three fourths of a drachm of the "solution of the bimeconate of morphia" were injected beneath the skin behind the left trochanter yesterday; the operation caused some drowsiness, and was followed by immediate relief of the pain; this relief has continued, with some slight remissions; no constipation.

8th.—The pain has returned with its usual severity; the injection was repeated this morning, in the same place.

9th.—He was free from pain during yesterday, but it returned in the evening and prevented sleep. Omit the iodide. R. Ferri et manganes. carb. sacch., gr. x., three times a day. The treatment by the injections of morphia was continued till the 17th; the amount injected was increased to one drachm of the solution, without causing narcotism; relief was obtained, but it was not permanent.

17th.—The morphia was injected this morning, and at 8½, P.M., one fourth of a drachm of a solution of aconite (gr. i. to ℥i.) was injected behind the right trochanter; the pupils were not affected, and he got no relief till the morphia was used later in the evening.

18th.—Half a drachm of the solution of aconitine was injected at noon, and again in the evening; no effect from the first, but relief followed the second injection; the pain returned at 6, A.M., of the 19th, and was quite severe at the visit of that day (10, A.M.), when one drachm of the solution of aconitine was injected. Relief was not obtained; the morphine was used in the evening, and he had a comfortable night. After the 20th, the aconitine was used altogether; it appeared to give some relief, and the largest dose given caused no affection of the pupils or vision; it was only used once in twenty-four hours after the 23d. The patient appeared to be improving slightly, but left the Hospital without permission, October 1st.

THE BOSTON MEDICAL AND SURGICAL JOURNAL.

BOSTON: THURSDAY, MARCH 28, 1861.

CURE OF RHEUMATISM BY LAYING ON OF HANDS.—As this method of treating all sorts of chronic complaints is somewhat in vogue here at the present time, and is withal somewhat expensive, we propose to enlighten our readers as to one of its modes of application, hoping that they may derive some profit therefrom. Our information is derived from the patient himself, who fully appreciates the *power* of such "gentle strokes of art." He is a man in very moderate circumstances, dependent on his daily labor for the support of himself and family, and for the last four months has been incapacitated for work by subacute rheumatism, which has been just severe enough to prevent his applying himself to his usual occupation, without confining him to his bed

or even to the house. Such patients, we all know, are very apt to keep along in the same state for a longer or shorter period, trying one remedy after another recommended by their friends, and rubbing off their cuticle by all sorts of stimulating lotions, without pursuing any very definite line of treatment, hoping from day to day that they will soon get better, and very often not applying to a physician at all; the disease being allowed to run itself out or yield to some temporary alleviation. Such a case was that of our patient, who had not consulted us in the present instance. At the earnest instigation of his friends (and it is curious to see how eager people are to subject their friends to such experiments), although against his better judgment, he was induced to make a call on the *soi-disant* Doctor, whose wonderful powers of manipulation fill the air with daily reports, but not without first providing himself with the liberal fee of five dollars—five times as much as we have usually charged him for a visit at his own house, which is at least a mile from ours. Dismal were the forebodings of his better half at the prospect before her, as she listened with awe not unmingled with apprehension, in an adjoining apartment, to the turbulent sounds which reached her ears from the room in which the hands were laid on. The shouts of imperative command to do this and that—the sharp, quick claps from the resounding palms of the gifted wonder-worker within, might well appal the weak or make the strongest tremble; as for its effects on the delicate nerves of invalids, we can well believe they might stimulate the feeblest to efforts that their most extravagant imaginations had not before suggested the possibility of. But to our case.

The particular parts in which rheumatism had fastened itself in our patient were the loins and heels. Across the former he had applied a plaster. On entering the operating room, he was stripped and laid on a couch with his face downward. Immediately the plaster was torn off and thrown into the fire, to prevent the possibility of a re-application. Then came the laying on of hands! This consisted in a series of most forcible compressions with both fists, emphasized by the whole weight of the operator, varied by sharp slaps upon the dorsal region (making the patient wince with pain, and recalling pungent reminiscences of school-boy days), and blows upon the soles of the feet in real bastinado style. "There," said the magician, "you will feel no more rheumatism!" "Well," said our startled, but not easily convinced friend, "I *guess* it will take more than one visit to do that." "Oh, I should be very happy to have a friendly call, but you will need no more treatment," said the doctor. To this our patient dissented, saying he didn't think the treatment would cure him. "Why, you haven't got no faith!" was the rejoinder. "You *are* cured." So saying, he hustled him into the adjoining apartment, throwing his clothes in after him, to make room for the next attendant on his marvellous powers. We forgot to mention the piles of eye-glasses and spectacles, and the heaps of crutches and canes, to which the layer-on of hands pointed to enforce his arguments. "See," said he, "all these things which my patients have left behind them." "Yes," was the reply, "I see, but they don't prove anything, except that they are there. It is no evidence that they were not needed any longer;" and we will add, it was no evidence that they were ever used, except to play the part they were then playing, that of arguments to people shallow enough not to see through such a flimsy trick of the trade. Our readers

will perhaps be surprised to know that our patient, notwithstanding such powerful counter-irritation (and irritation), making his dermal surface of the most lively red, as his wife testifies, was not cured of his rheumatism, nor even benefited. Nay, he even looks back with some regret to the loss of his five dollars and his plaster. We have heard of other equally triumphant results of this treatment, which, we are told, is making a clean sweep of all the chronic cases in the land. Such is laying on of hands here in Boston, in the nineteenth century!

Liberal Gift to the Boston Society of Natural History.—We are pleased to place on record the donation to the Boston Society of Natural History, of property valued at thirty thousand dollars, by Dr. William J. Walker, of this city. This Society has always been managed on the most liberal principles; from the first it has numbered among its most active members representatives of the medical profession, and we are glad that one of the same profession has thus liberally recognized its claims to encouragement and support. Nothing but want of means has prevented this Society from opening the doors of its Museum gratuitously to the public every week day, as it does now on Wednesdays. Should the long-wished-for grant of land in the Back Bay territory be made by the State, the Society is prepared at once to commence the erection of a suitable building for their library and museum, for which their present accommodations are quite insufficient. Such a donation would be in keeping with the liberal spirit which our State has always shown towards institutions of learning and popular education, and would enable the Natural History Society to put up a structure which would be an ornament to the city, and give a new impulse to the study of one of the most delightful of sciences among our people.

Editorial Changes and Reverses.—Dr. Anthony A. Peniston is announced as Editor of the *New Orleans Medical News and Hospital Gazette*, in place of Dr. D. Warren Brickell, who retires from the field. We regret that in taking leave of his readers he is obliged to make such a disheartening statement as this:—"We have labored five long years without one cent of reward, and now to our ledger there is, independent of all advance payments for the coming volume, an indebtedness of over $5,000!!" We sincerely hope, for the credit of the profession, that his successor may be able to show a fairer page of obligations honorably met.

The *Louisville Monthly Medical News* expired with the last year, for want of proper support. The Editor, in his Valedictory, says to delinquent subscribers, "Gentlemen, your kindness has been our ruin—your favors, our destruction—your smiles, our tears—your approval, our bankruptcy."

The *Georgia Medical and Surgical Encyclopædia* closed a brief existence of eight months, with the year 1860. The enterprise failed for want of that support which is the *pabulum scientiæ* quite as much as the sinews of war.

Case of Triplets. *Messrs. Editors*,—If you deem it a matter sufficiently rare to interest the readers of the Journal, you may announce the birth of *triplets*, two daughters and a son, on the 17th inst., in our village. Period of ges-

tation, seven and a half months. Mother and children apparently doing well at the present date. Yours respectfully,

St. Albans, Vt., March 21st, 1861. J. L. CHANDLER.

MEDICAL COMMENCEMENTS.—The commencement exercises of Starling Medical College took place on the evening of the 28th of February, in the Westminster Church, Columbus, Ohio. The Annual Address was delivered by Dr. James Hogue; the Valedictory by Prof. T. G. Wormley, M.D. The degree of Doctor in Medicine was conferred on 16 gentlemen.—The public commencement of the Jefferson Medical College of Philadelphia was held on the 9th of March, 1861, when the degree of Doctor of Medicine was conferred on 187 graduates by the Hon. Edward King, LL.D., President of the Institution; after which a Valedictory Address to the graduates was delivered by Prof. Mitchell.

MORTALITY OF MONTREAL.—The last number of the *British American Journal*, published at Montreal, in an interesting article on the vital statistics of that city, states that the mortality there for the year 1860 was 3,174 in a population of 101,602—being a death proportion of 1 to every 32.01 inhabitants, or a ratio of 3.12 per cent. This ratio, however, it is stated, should be diminished on account of quite a number of the burials in the city being of persons who die in the adjoining villages. This is a great improvement in the sanitary condition of Montreal, as it is further stated that in 1846 the mortality was 1 to every 23.60 inhabitants, or 4.23 per cent.; and in 1836, 1 to every 19, or 5.26 per cent.

VITAL STATISTICS OF BOSTON.

FOR THE WEEK ENDING SATURDAY, MARCH 23d, 1861.

DEATHS.

	Males.	*Females*	*Total.*
Deaths during the week,	38	43	81
Average Mortality of the corresponding weeks of the ten years, 1851-1861,	39.5	35.5	75.0
Average corrected to increased population,	..	..	83.7
Deaths of persons above 90,	..	1	1

Mortality from Prevailing Diseases.

Phthisis.	Croup.	Scar. Fev.	Pneumonia.	Measles.	Variola.	Dysentery.	Typ. Fev.	Diphtheria.
13	2	4	5	0	0	1	0	0

METEOROLOGY.

From Observations taken at the Observatory of Harvard College.

Mean height of Barometer,	30.003	Highest point of Thermometer,	39°
Highest point of Barometer,	30.440	Lowest point of Thermometer,	2°
Lowest point of Barometer,	29.336	General direction of Wind,	N. & N.E.
Mean Temperature,	26°.3	Am't of Rain (in inches) melted snow,	4.750

From Observations taken by Dr. Ignatius Langer, at Davenport, Scott Co., Iowa. Latitude, 41.31 *North. Longitude*, 13.41 *West. Height above the Sea*, 585.

		BAROMETER.						THERMOMETER.					SNOW & RAIN.		Mean Amount of Cloud. 0 to 10.
		7 A.M.	2 P.M.	9 P.M.	Mean Height.	Highest Point.	Lowest Point.	7 AM	2 PM	9 PM	Mean Height.		Time	Measure.	
Monday,	March 11,	29.71	29.43	29.29	29.57	29.80	29.20	26	51	44	34.66		Light snow.	0.00	5
Tuesday,	" 12,	29.20	29 34	29.53				47	55	43					
Wednesday,	" 13,	29.68	29.73	29.80				23	30	26					
Thursday,	" 14,	29.79	29.68	29.60				20	37	29					
Friday,	" 15,	29.42	29.29	29.24				31	48	40					
Saturday,	" 16,	29.82	29.37	29.54				34	48	34					
Sunday,	" 17,	29.85	29.89	29.85				19	24	19					

BOOKS RECEIVED.—Tenth Annual Report of the New York Asylum for Idiots.—Prof. Mitchell's Farewell Address to the Graduating Class of Jefferson Medical College, Philadelphia.

DEATHS IN BOSTON for the week ending Saturday noon, March 23d, 81. Males, 38—Females, 43.—Apoplexy, 4—disease of the bowels, 1—inflammation of the bowels, 2—congestion of the brain, 1—disease of the brain, 4—bronchitis, 4—cancer, 4—consumption, 13—croup, 2—convulsions, 2—cyanosis, 1—diarrhœa, 1—dropsy, 2—dropsy of the brain, 4—dysentery, 1—erysipelas, 1—scarlet fever, 4—gastritis, 1—disease of the heart, 1—homicide, 2—infantile disease, 1—intemperance, 3—congestion of the lungs, 2—inflammation of the lungs, 5—marasmus, 2—old age, 2—peritonitis, 2—pleurisy, 1—premature birth, 1—pyæmia, 1—suicide, 1—unknown, 3—whooping cough, 2.

Under 5 years of age, 30—between 5 and 20 years, 3—between 20 and 40 years, 25—between 40 and 60 years, 13—above 60 years, 10. Born in the United States, 51—Ireland, 22—other places, 8.